The

VMS  LINUX

Controls Software Migration

- ~3 Years ago AD decided to migrate the accelerator controls from VAX-VMS to Linux
- The migration was planned to take place in three phases ..
  - Phase I : console infrastructure
    - Completed early this year
  - Phase II : console applications
    - Will complete by end of December
  - Phase III : system services
    - Scheduled to be completed during next major shutdown

Major Players

- Phase I
  - AD Controls Dept, led by Carl Schumann
- Phase II
  - Division wide effort
  - P.K., C. Schumann, W. Kissel
  - D. Broemmelsiek, J. Budlong, J. Cai, D. Capista, G. Ganster, W. Higgins, P. Lucas, K. Martin, J. Patrick, R. Thurman-Keup, R. Tokarek, A. Waller
- Phase III
  - AD Controls Dept, led by Carl Schumann

Strategy

- Chose to migrate applications a few at time rather than all at once
- Duplex Consoles
  - Run Linux or VMS version depending on each application's migration status
  - Ability to run both versions side by side for testing
  - Ability to revert to the VMS version in case of problems with newly certified Linux versions

Strategy (cont.)

- Communication between applications that involves binary floating point data
  - Many paths: Startup arguments, network communication, shared files, etc.
- Decided to make VMS floating point format the "lingua franca"
  - Avoided having to modify VMS applications and existing binary files
  - Effectively decouples the migration of applications that "talk" to each other
  - Creates an ugly legacy issue for new applications

Phase II

- Accumulated “soft” information about each application
  - Updated keeper information
  - Determined department affiliations
  - Classified by sensitivity to operations
  - Identified obsolete applications (25%)
- Controls department ported applications
  - Fixed compiler errors (C++ compiler on Linux)
  - Identified and addressed known issues (i.e. floating point, VMS file specifications, etc)

Testing

- Required level of testing depends on the applications sensitivity
- Insensitive: Keeper tests and signs off.
- Moderate: Keeper and affiliated department liaisons sign off on testing
- Sensitive: Keeper and affiliated department liaisons sign off on testing AND testing must be scheduled through operations.

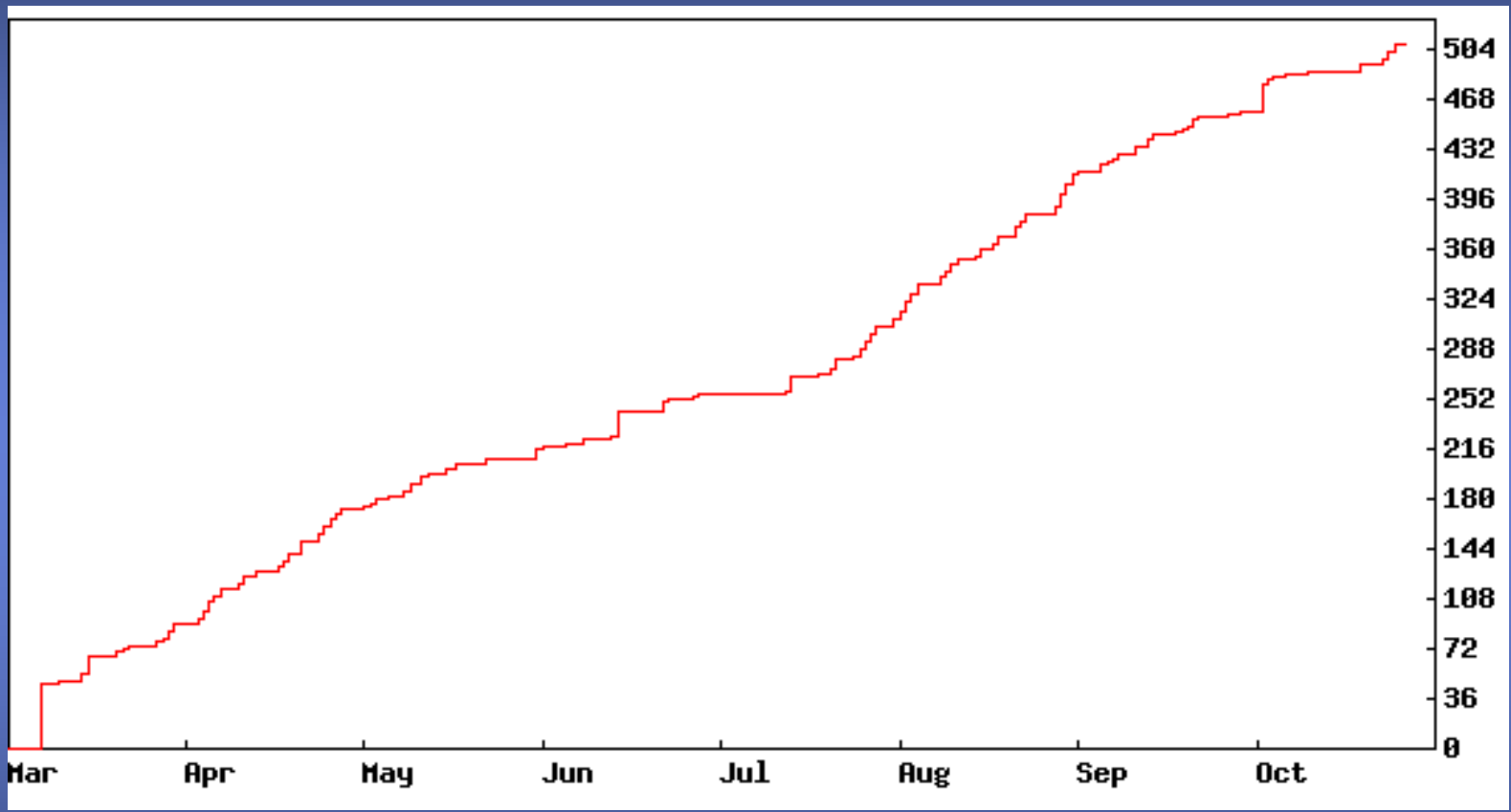
Certification

- Once all sign offs have been logged in the database the application is ready for certification
- Certification is done through a gatekeeper
  - Control rate
  - Give operations a “heads up” before a sensitive application is certified
- Once certified, the Linux version becomes the default launched by the duplex consoles

Testing

- An application is not considered to be migrated until it has been certified as working on Unix
- Level of testing will depend on ...
  - Program complexity
  - Operational sensitivity
- The keeper can handle simple applications
- But some will probably require …
  - Beam time for testing and debugging
  - Formal “sign-offs” by all affiliated departments

Progress



- 87% complete on Oct. 27
  - 502 applications certified
  - 4 ready to be certified
  - 63 remain to be tested
  - 68 Linux only applications

Negligible Downtime

- MCR log book search found 4 migration related incidents
  - May 28: Use of uncertified version of T27
  - June 20: I68 problem
  - July 18: Tev orbit monitor problem. Testing not properly scheduled
  - July 21: Phase III work clogs file server
- No down time was logged for any of them

Future

- Will complete application migration by end of this year
- Start decommissioning 70 VAX's 1/1/2007
  - Dismantle duplex console infrastructure
- Complete decommissioning before 2007 shutdown
- Complete phase III during shutdown
  - Control system becomes independent of VAX-VMS machines